

Research on the support to the development of critical thinking in primary school students in Montenegro (Program RWCT)

Subject:

The research is focused on teaching and learning practices in primary schools in Montenegro with regard to supporting the development of critical thinking of students through the program RWCT.

Research problem:

Education reform in Montenegro began in 2000. Strategic document that set the reform guidelines The Book of Changes was published in 2001. Based on it, during 2002 and 2003, the parliament adopted laws in the field of education, and a strategic document named BASIS FOR THE INNOVATION OF CURRICULA that served as a starting point for drafting new curricula for primary and secondary schools and vocational education. Implementation of the new curriculum started in the academic 2004/05 (elementary schools). **The aim of the reform was to change the role and status of students in schools and increase the quality of their knowledge.** Thus defined goal implied a change in almost all important aspects of the process of education, starting with the modernization program and the learning content, the introduction of active and interactive methods and forms of teaching/learning in schools to change the relationship teacher- students and total atmosphere in school.

When it comes to the issue of the quality of knowledge in the reform document, it refers to knowledge that is not reduced to simple remembering and reproducing information, but includes "understanding and application of knowledge in new situations," "autonomous search for the necessary information, data or methods to solve problems," "the engagement of the higher forms of learning and thinking," and especially "critical thinking". In accordance with these, high-quality teaching will be considered the way of teaching which fosters the development of critical thinking in students. It is teaching which uses active and interactive methods of learning, lessons that engage higher-order thinking and stimulate mutual cooperation and exchange of views; teaching that takes place in an atmosphere of equality and mutual respect for the opinions of students and teachers in the classroom.

In order to raise the competences of teachers for quality teaching, Bureau of Education and other governmental organizations and NGOs have had a significant share in improving teachers' practices in accordance with the new values and goals of learning. One of the most important training programs realized by the Bureau of Education and Pedagogical Centre of Montenegro and implied the training of teachers for the implementation of RWCT-learning methods and the development of critical thinking in students. RWCT Program (Reading and Writing for Critical Thinking) is a comprehensive teacher training program, aiming to introduce the teaching methods and learning techniques that involve active learning and critical thinking. Critical thinking here is defined as active and interactive cognitive process that begins with information and ends with a decision. RWCT methods include research strategies, creative thinking, cooperative learning, discussion and debate. Training includes

¹Research team: design of the Research: mr Zoran Lalović, independent adviser in the Department of Education; tools and databases: mr Zoran Lalović; field research and data entry: Danilo Leković, Pedagogical Center of Montenegro; The statistical and logical data processing mr Zoran Lalović; Writing research reports: mr Zoran Lalović; Translation of the report into English: Danilo Leković.

four two-day seminars, practical applications in the classroom, reflection meetings and procedures of certifying teachers. Bureau of Education's data in the period from 2009 to 2011 show that 32 seminars were held, with total number of 584 teachers trained.

The aim of the research

- To determine the extent to which teaching/learning in primary schools in Montenegro support the development of critical thinking
- Given the support for the development of critical thinking in students, we want to determine whether the RWCT teachers' teaching differs from the teaching of those who were not trained to apply RWCT –methods (subject teachers).

Tasks of the research

Based on the opinions of subject teachers and their students regarding the teaching and learning processes in Montenegrin schools, we tried to investigate:

- 1. The extent to which teachers have the competence to develop critical thinking in student;**
- 2. Which goals do teachers have in mind when planning and realizing the teaching;**
- 3. The extent to which certain activities that foster development of critical thinking² exist in teaching practice.**
- 4. If the assessment of students is aligned with the principles of critical thinking;**
- 5. If the teaching of RWCT teachers differs from the NON-RWCT teachers;**

² Activities and procedures, i.e. teaching which support the development of critical thinking will be explained in the text below.

Teaching and learning that support the development of critical thinking in students - description of the research indicators

For the purposes of this study, based on analysis of relevant literature and RWCT publications, we singled out eleven major indicators that are in our opinion measurable and that can well describe the teaching/learning that supports the development of critical thinking of students in elementary schools in Montenegro

Aims of the Research	Indicators of teaching/learning that supports the development of critical thinking in students	Tasks and research instruments
<ul style="list-style-type: none"> To determine the extent to which teaching/learning in primary schools in Montenegro supports the development of critical thinking Given the support for the development of critical thinking in students, we want to determine whether the RWCT teachers' teaching differs from the teaching of those who were not trained to apply RWCT –methods (subject teachers). 	<ol style="list-style-type: none"> The atmosphere of learning that is characterized by freedom of thought, expression and critical attitude Learning is based on multiple sources of information Engaging learners' prior knowledge and out-of-school experiences in teaching Learning with understanding Active learning - learning content analysis Creative activities of students - synthesis Evaluation – assessment of quality by students Interactivity, exchange of opinions by students in the process of teaching/learning Assessment is aligned with the development of critical thinking students Goal-oriented teaching / teacher Teacher's competences for the development of critical thinking in students 	<p>Opinions of teachers on the importance of particular goals and learning activities at school.</p> <ul style="list-style-type: none"> Questionnaire for teachers Student Questionnaire

1. Open, free and critically-oriented learning atmosphere

Determining the extent to which the school allows freedom of opinion, expression and critical attitude of its students.

An open, free and critically minded atmosphere is the first prerequisite for learning, expression, and then the development of critical and creative thinking of students. Critical and creative thinking occurs when there is no mentality of a single correct answer (Banks, 1988). Important indicators of teaching that fosters the development of critical thinking, according to Taylor, Fraser and White (1994) are freedom of opinion and expression in students and their critical stance on matters related to learning content and learning objectives and methods. Within the “critical attitude” scale in CLES (Constructivist Learning Environment Survey, Taylor, Fraser and Fisher, 1997), which assesses the perception of students about the opportunity to review teaching situations, we find indicators that indicate the extent of freedom to ask questions why he or she learns something, why are they being taught in this or that way, to the search for explanations, or to have the freedom to present their opinions, etc.

The aim of this research is to determine the extent to which the school allows freedom of opinion, expression and critical attitude of students, i.e. the extent to which the student feels free to tell his or her the teacher what he thinks, to ask a question, to comment, to express a doubt or disagreement regarding the content of learning, the way of teaching, or to seek further explanations.

Indicators:	Student :
Open, free and critically minded learning atmosphere	Freely, without fear, speak their mind and/ or comments, ask the teacher questions and/or seek clarification regarding the content of learning and/or teaching.

2. Multiple sources of information

Determining the extent to which learning in school is based on multiple sources of information.

From the standpoint of the development of critical thinking, using a number of different sources of information and activities of selecting and comparing information, especially those that reflect different positions, are necessary conditions of learning. This comparison involves the assessment of the quality of information as well as choosing when and how to use certain information, so these processes, (evaluation and selection of information) are the basis of the development of critical thinking of students.

The aim of this research is to determine the extent to which learning in school is based on multiple sources of information, i.e. the extent to which students are able or expected to use other sources of

information, such as Internet, encyclopedias and other books, from local or school libraries, during learning in school or during doing their homework, in addition to the regular usage of textbooks.

Indicators:	Student:
Multiple sources of information	While learning in school or at home students are using different sources of information : the textbook, internet , books, dictionaries, encyclopedias, etc.

3. Evocation, engagement of students' prior knowledge

Determining the extent to which teaching practice activates the student's prior knowledge and out-of-school experience.

Within RWCT program (Reading and Writing for Critical Thinking), evocation, - determination, evoking and connecting previous and new knowledge in students is the first stage of ERR (Evocation - Realization of Meaning, Reflection) active learning and the development of critical thinking, in which several important cognitive activities take place. Students actively remember everything they know about a topic, review their knowledge and connect the known with unknown. For the constructivist-oriented authors, learning process is the process of building new upon the foundations of previous knowledge, and the evocation of previous knowledge is a very important link in the process. New contents are learned better, says Roth (1990) when we build up on students' prior knowledge and experience since it allows them to connect what they already know with new information. Evocation of previous knowledge of the students can be done in various ways: the information they learned earlier in the same or other subjects can be repeated and presented in a new way, a lot can be done to connect the various parts of previous knowledge and experience in a new meaningful whole, one can list the different students' experiences and simply compare them etc.

The aim of this research is to determine the extent to which teaching engages students' previous knowledge and out-of-school experiences, or how often teachers, when processing a new topic, establish students' prior knowledge, ask students about their experiences related to the topic, associated with has been previously taught in the same or other subject with newly taught contents, etc.

INDICATORS:	STUDENT:
Evocation, engagement of students' prior knowledge and experience	Students actively remember and reveal all they know about a topic in classroom, review their knowledge and connect what they known with the unknown.

4. Understanding

Determining the extent to which the school encourages actions that facilitate the understanding of the learning content.

Within RWCT (Reading and Writing for Critical Thinking) program, understanding is the second phase of ERR (Evocation, Realization of Meaning, Reflection) active learning and the development of critical thinking, which is made of several important cognitive activities. Unlike passive acceptance, literal memorizing the content of learning, understanding here implies active, meaningful organization and reorganization of content that is being taught. To understand is to be able to express some content, an idea that is taught, in one's own words, or in a different way. According to Bloom (1956), among school activities that support the understanding, there are several which are highly important: the task of translation, i.e. expressing learned content in another form, in a different way or other means (own words, less abstract terms, or in a different symbolic form); the task of interpretation, i.e. understanding the relevant importance of ideas and their relationships in order to draw conclusions based on that; the tasks of exploration or testing capabilities to draw conclusions, implications or projections from the interpretation of the content, especially those that are not directly (explicitly) given in the text, but logically stem from it, etc.

The aim of this research is to determine the extent to which the school requires from its students to learn with understanding, that is, how often does the school require from them to extract what is most important in a text, to put down comments next to the text, to make presentations from lessons and to draw one's own conclusions, etc.

INDICATORS:	STUDENT:
UNDERSTANDING	Performs an active organization and reorganization of the content that is being taught (highlights the most important theses, summarizes the lesson, draws conclusions)

5. Analysis of content that is being taught

Determining the extent to which teaching supports the activities leading to the analysis of the content that is being taught.

Learning is an active process when students are intellectually engaged, when they analyze, compare and explain the information that they learn. Among the activities that require an analysis of the content that is taught, according to Bloom (1956) these appear to be the most appropriate: analysis of content elements (identification of the content element), analysis of the relationships among the elements (e.g., the relationship of generality, causal and temporal relationships, logics behind argument, consistency in proving, etc.), analysis of organizational principles (perceiving structural characteristics of the text that makes it a whole; identifying which parts have meaning in relation to the whole), etc.

The aim of this research is to determine the extent to which the learning activities are present in the process of teaching/learning : ANALYSIS, i.e. how often teachers require from their students to decompose a whole, such as the text, to the constituent elements; COMPARISON, to perceive similarities and/or differences, common and distinctive features (in texts, information, objects, phenomena, etc.); EXPLANATION, i.e. to determine the meaning, purpose of certain parts e.g. to determine the causes and consequences.

INDICATORS:	STUDENT:
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ANALYSIS	Decomposes a whole, e.g. text from a textbook , into its constituent elements
COMPARISON	Compares (lists similarities and/or differences, common and distinctive features of the texts, information, objects, phenomena , etc.)
EXPLANATION	Determines the meaning of certain parts (for example, the relationship of causality)

6. Synthesis, creative activity of students

Determining the extent to which teaching supports synthesis, and the creativity of students.

One of the tasks of school activities is that a student has a possibility to create new product (text, presentation, explanation, model ...) based on the known ideas, or what had been previously taught. Among the activities that require synthesis, claims by Bloom (1965), particularly important are: creating original and independent reports, integrating several new ideas, creating a plan or changing the direction of operations, etc. Creativity of students becomes visible in all the tasks that require the student to authentically present some data or solution in situations where there is room for individual choices, decision-making and coming up with original solutions.

The aim of this particular research is to determine the extent to which teaching supports creativity in students, .i.e. how often it requires from students to independently make a statement, to plan an activity, to propose ideas or anticipate consequences of events, etc.

INDICATOR:	STUDENT:
SYNTHESIS	The student creates a (for students / learners) new product (text, presentation, explanation, model ...).

7. Evaluation, critical thinking

Determining the extent to which teaching supports the evaluation, and critical thinking in students.

Implies tasks or learning activities of students that require demonstration of skills evaluation, i.e. the valuation of any content, with clear, explicit criteria. Criteria for evaluation can be: internal - accuracy, logical correctness of the conclusions, consistency, integrity and coherence, or external - standards that apply in general to evaluate the works of some sort and that allow for works the same kind to be compared.

The aim of this research is to determine the extent to which the teaching supports evaluation, i.e. how often the school requires students TO EVALUATE, i.e. to assess / evaluate the quality, accuracy, relevance, appropriateness of something, and TO ARGUE, or to list arguments for their own opinions (attitude, belief, inclination).

INDICATORS:	STUDENT:
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EVALUATION	Assesses / evaluates the quality, accuracy, relevance, appropriateness of something (e.g. opinions, conclusions, decisions, etc.)
ARGUMENTATION	Explains, specifies arguments for their own opinions (attitude, belief, inclination)

8. Interactivity of learning

Determining extent to which learning takes place through discussion and exchange of views in the classroom.

In addition to the active, interactive learning is yet another important condition for the development of critical thinking in students. The active learning engages students intellectually. This intellectual activity may appear at different levels, from simple acceptance to the analysis and evaluation of the content that is being taught. The higher the level of thinking activity in students the more quality is the teaching itself. Interactive learning includes all forms of teaching and learning that take place through interaction, that is the exchange of opinions between teachers and students in the classroom. There are many methods and techniques of interactive learning. Interactive learning occurs when students learn and work together in pairs or small groups to solve a common task, explore a common theme, create a product etc. One of the scales involved in the instrument that measures the constructivist approach to learning is Dr. Taylor's scale of the interactivity of learning (Taylor, Fraser and White, 1997). This scale of the interactivity of learning - CLES (Constructivist Learning Environment Survey, Taylor, Fraser and Fisher, 1997) includes indicators that measure the participation of students in debate, discussion and group work forms etc.

The aim of this research is to determine the extent to which learning takes place in pairs or small groups, or how often students have the opportunity to discuss, debate, and learn in a group.

INDICATORS :	STUDENT :
INTERACTIVITY	Students learn through discussion and exchange of ideas in pairs or in a group

9. Assessment

Determining the extent to which the assessment stimulates critical and creative thinking in students.

Assessment is significantly defines outcomes of school learning. The constructivist teaching changes the demands the school sets before its students. Instead of demands such as: who (...discovered America?) where, when, how, count etc. the following emerge as the most important: Create a summary!; Get main ideas!; Draw conclusions; Use something in the new situation! etc. In addition to these, the constructivist-based educational process, equally present are the demands whose

primary goal is not to make student offer a predetermined fixed and the only exact answer, but the goal is the process of arriving at an answer. The students, for example, seek to propose a resolution to a problem, to predict the consequences of an event, to find new meanings for the known facts, to come up and offer new products, etc. Previously, students were expected to demonstrate discipline in thinking, clear expression and obedience in acting. New requirements favor: initiative, independence, creativity and critical spirit of students.

The aim of this research is to determine to which the assessment stimulates critical and creative thinking in students i.e. how important to the teacher is the student's independence, initiative, creativity, and how independent in thinking and active in the discussions they are

INDICATOR:	TEACHER:
ASSESSMENT	when assessing student teacher respects the independence, initiative, creativity, independence of opinion and engagement in discussions

10. Goal oriented teacher

To what extent is the teaching goal –oriented?

New curriculum (educational program) in Montenegro is significantly different from the previous one, not only in terms of its content, but also rather in terms of the access to education. Previous program belonged to the so-called contextual approach to planning teaching, and represents, while the new one takes into consideration both target and process – and it is called developmental planning. Previous program answered the question of what the teacher should teach, while the new one focuses on how, why and how students should learn. The old one listed contents, while the new lists: goals and outcomes. When preparing for their classes teachers are expected to follow the program's objectives and to plan learning activities in class. To accomplish its role as a teacher, one has to think about how learning contents from his subject may contribute to the overall objective of students' education: solid knowledge, developed cognitive skills and capabilities for learning, problem solving, creative and critical thinking; how it develops social skills - teamwork, argumentation of expression, tolerance in discussing; and how it develop values - a sense of justice and fairness, solidarity, responsibility, and the like.

The aim of this research is to determine the extent to which during the planning and preparation of teaching Montenegrin teachers follows the program objectives, such as: the development of cognitive skills and abilities (e.g. ability to analyze , compare and connect knowledge and information), creativity (ability to generate new knowledge and information), critical thinking (the ability to evaluate and select knowledge and information), communication skills (ability to present, and to have a dialogue), the ability for cooperation and teamwork; the development of traits that as independence, initiative , tolerance , etc.

INDICATORS :	TEACHER :
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GOAL ORIENTED TEACHER	When planning and practicing instruction teacher starts from the goals related to the development of cognitive skills of critical thinking of students.
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11. Teacher competences for the development of critical thinking in students

To which extent do teachers possess the competences for the development of critical thinking?

Teacher's competences and qualifications to apply the methods of active and interactive learning and the development of critical thinking in students were examined through the attendance to the RWCT seminars and seminars based on RWCT methods, and on the basis of self-assessment of teachers about their competences for the application of active learning methods, application of methods of interactive learning to develop critical thinking, competences for the development of communication skills and the ability to train students for teamwork and cooperation.

INDICATOR:	TEACHER:
QUALIFICATION FOR THE DEVELOPMENT OF CRITICAL THINKING OF STUDENTS	Teacher is qualified for the development of critical thinking of students

Methods and techniques of research

In this research there will be used: survey method in order to determine the opinion of teachers and students on the importance of certain learning activities at school that are of importance for the development of critical thinking of students

Research instruments used:

- Questionnaire for teachers (indicators: 9. Assessment for the development of critical thinking in students; 10. Goal oriented teaching; 11. Teacher competences for the development of critical thinking in students)
- Questionnaire for students (indicators: 1. Open, free and critically-oriented learning atmosphere 2. Multiple sources of information 3. Evocation, engagement of students' prior knowledge 4. Understanding 5. Analysis of content that is being taught 6. Synthesis, creative activity of students 7. Evaluation, critical thinking 8. Interactivity of learning)

The results were processed using the SPSS 19, and the results are expressed as percentages and arithmetic means.

Research sample:

The study sample was drawn up on the basis of the following criteria.

- Schools were selected according to the territorial principle: the southern, central and northern region
- Teachers in schools were selected on the basis of whether they attended the program RWCT or not.
- Students were selected on the basis of whether their teacher attended the training RWCT or not.

The sample included the following schools: Boško Buha, Pljevlja; Vukašin Radunović, Berane; Risto Manojlović, Kolašin; Božidar Vuković Podgoričanin, Podgorica; Marko Miljanov, Podgorica; Štampar Makarije, Podgorica; Luka Simonović, Nikšić; Mileva Lajović-Lalatović, Nikšić; Dašo Pavičić, Herceg Novi; Boško Strugar, Ulcinj.

The sample included 101 teachers - 51 teachers who attended the program RWCT and 50 teachers who have not attended this program.

TABLE 1.
Structure of the sample according to the subjects

	RWCT/YES	RWCT/NO
language and literature	16	12
history	11	5
geography	5	4
foreign language	7	13
biology	4	13
musical education	5	3
civic education	3	
total:	51	50

The sample included 574 students, 281 from classes in which the teacher completed RWCT training and 293 students from the classes taught by a non-RWCT training.

Limitations of the research:

The answer to our first question, which deals with the extent to which teaching/learning in primary schools Montenegro supports the development of critical thinking, has certain limitations. Specifically, since the answer to this question relies on the subjective testimony of teachers and students who are somewhat aware of the goals of the research, it can be expected that all given values may be shifted in the expected positive direction. So the answer to our question, the extent to which teaching/learning in primary schools Montenegro supports the development of critical thinking students, actually answers the question of how it would look if the teachers put the maximum effort in their teaching, in terms of their knowledge and skill which would be devoted solely to development of critical thinking of students.

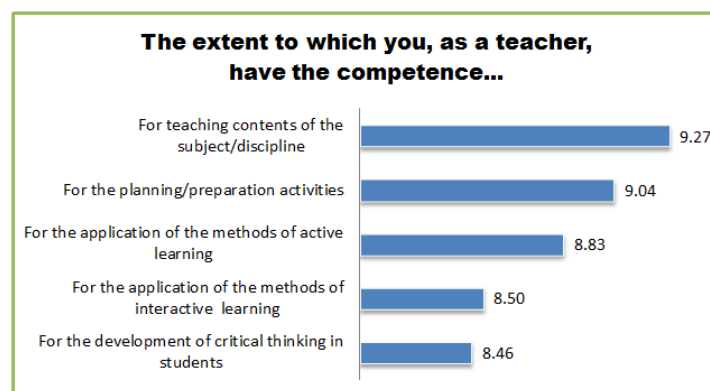
The answer to the second question, whether the teaching of the RWCT teachers differs from the teaching of other, should not have such restrictions, because one can expect that the maximum effort put into the teaching process by teachers trained in the application of methods RWCT should be more prominent and visible when compared to teachers who have not had such training.

Research results:

1. How competent are Montenegrin teachers for the development of critical thinking in students?

Teachers' competences and qualifications of teachers to apply methods of active and interactive learning and the development of critical thinking among students were investigated through their presence at RWCT seminars, seminars based on RWCT methods, as well as on the basis of self-assessment of teachers about their competences for the application of active learning methods; application of interactive teaching methods; development of critical thinking; developing of communicative skills and abilities and their ability to train students for teamwork and cooperation.

Table 2
Arithmetic means of self-assessment of teachers' competences
for specific teaching roles on a scale of 1 to 10
(total sample)



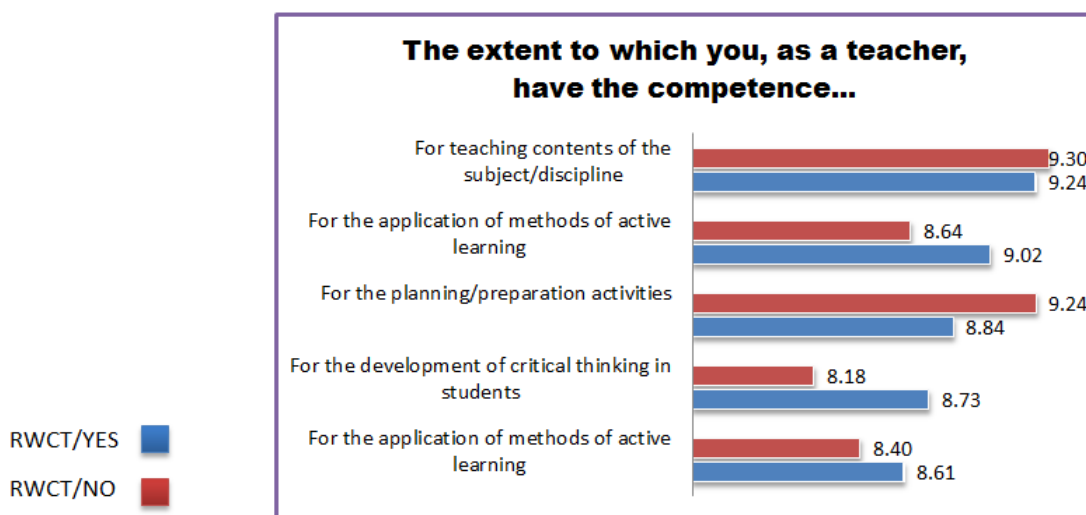
Teachers are trained for the traditional roles of teaching (see Table 2); for planning classes and lecturing the program contents. Compared to these, teachers are less competent in applying the methods of active and interactive learning, and especially for the development of critical thinking in students.

Table 3
Arithmetic means of self-assessment of teachers' competences
for specific teaching roles on a scale of 1 to 10
(separately for RWCT/YES and RWCT/NO)

	RWCT/YES	RWCT/NO
For the application of methods of interactive learning	8.61	8.40
For the development of critical thinking in students	8.73	8.18
For the planning/preparation activities	8.84	9.24
For the application of methods of active thinking	9.02	8.64
For teaching contents of the subject/discipline	9.24	9.30

Teachers who attended the RWCT program consider themselves more competent in relation to other teachers in applying methods of active and interactive learning, and especially for the development of critical thinking in students (see Tables 3 and 4).

Table 4
Arithmetic means of self-assessment of teachers' competences
for specific teaching roles on a scale of 1 to 10
(separately for RWCT/YES and RWCT/NO)



2. What goals do teachers have in mind when planning and realizing teaching?

The research identified the extent to which teachers, when planning and preparing the teaching, have in mind the program objectives such as the development of cognitive skills and abilities (e.g. ability to analyze, compare and integrate knowledge and information); creativity (the ability of producing new knowledge and information); critical thinking (the ability to evaluate and select knowledge and information); communication skills (ability to present, display, and have an argued dialogue); ability of cooperation and teamwork; personality traits such as independence, initiative, tolerance, etc.

Table 5
Displaying the ranked goals in order of importance in the whole sample

It is important for students...

1. TO DEVELOP THE ABILITY TO LEARN
2. **TO DEVELOP CRITICAL THINKING AND REASONING SKILLS**
3. TO BE ABLE TO SOLVE PROBLEMS
4. TO DEVELOP THE ABILITY TO EXPRESS THEMSELVES AND COMMUNICATE WITH OTHERS
5. TO DEVELOP SELF-RELIANCE AND INDEPENDENCE OF THOUGHT
6. TO LEARN THE CORRECT USE OF CONCEPTS AND TERMS IN THE FIELD THEY STUDY
7. TO UNDERSTAND THE WORLD AROUND THEM
8. TO MASTER THE KNOWLEDGE AND INFORMATION THAT MODERN SCIENCE REACHED IN THE PARTICULAR FIELD
9. TO DEVELOP CREATIVITY AND IMAGINATION
10. TO DEVELOP THE SKILLS NEEDED FOR TEAM WORK AND COOPERATION

Among the three main goals of the school in Montenegro teachers list the development of critical thinking in students (see Table 5). This goal takes the second place in importance behind the goal to develop the ability to learn. When comparing two sub-samples of teachers in relation to the assessment of the importance of individual school goals we observe significant differences (see Table 6). Teachers who did not attend RWCT training not only neglect the importance of developing critical thinking in students, but to a greater extent focus on the transfer of knowledge and information, and the knowledge of the concepts and terms.

Table 6
Displaying the ranked school goals in order of importance in sub-samples
teachers who did / did not attend RWCT program

RWCT/YES	<ol style="list-style-type: none"> 1. TO DEVELOP CRITICAL THINKING AND REASONING SKILLS 2. TO DEVELOP THE ABILITY TO LEARN 3. TO BE ABLE TO SOLVE PROBLEMS 4. TO DEVELOP SELF-RELIANCE AND INDEPENDENCE OF THOUGHT 5. TO DEVELOP THE ABILITY TO EXPRESS THEMSELVES AND COMMUNICATE WITH OTHERS 6. TO UNDERSTAND THE WORLD AROUND THEM 7. TO DEVELOP CREATIVITY AND IMAGINATION 8. TO DEVELOP THE SKILLS NEEDED FOR TEAM WORK AND COOPERATION 9. TO LEARN THE CORRECT USE OF CONCEPTS AND TERMS IN THE FIELD THEY STUDY 10. TO MASTER THE KNOWLEDGE AND INFORMATION THAT MODERN SCIENCE REACHED IN THE PARTICULAR FIELD
RWCT/NO	<ol style="list-style-type: none"> 1. TO DEVELOP THE ABILITY TO LEARN 2. TO BE ABLE TO SOLVE PROBLEMS 3. TO LEARN THE CORRECT USE OF CONCEPTS AND TERMS IN THE FIELD THEY STUDY 4. TO DEVELOP THE ABILITY TO EXPRESS THEMSELVES AND COMMUNICATE WITH OTHERS 5. TO DEVELOP CRITICAL THINKING AND REASONING SKILLS 6. TO DEVELOP SELF-RELIANCE AND INDEPENDENCE OF THOUGHT 7. TO MASTER THE KNOWLEDGE AND INFORMATION THAT MODERN SCIENCE REACHED IN THE PARTICULAR FIELD 8. TO UNDERSTAND THE WORLD AROUND THEM 9. TO DEVELOP CREATIVITY AND IMAGINATION 10. TO DEVELOP THE SKILLS NEEDED FOR TEAM WORK AND COOPERATION

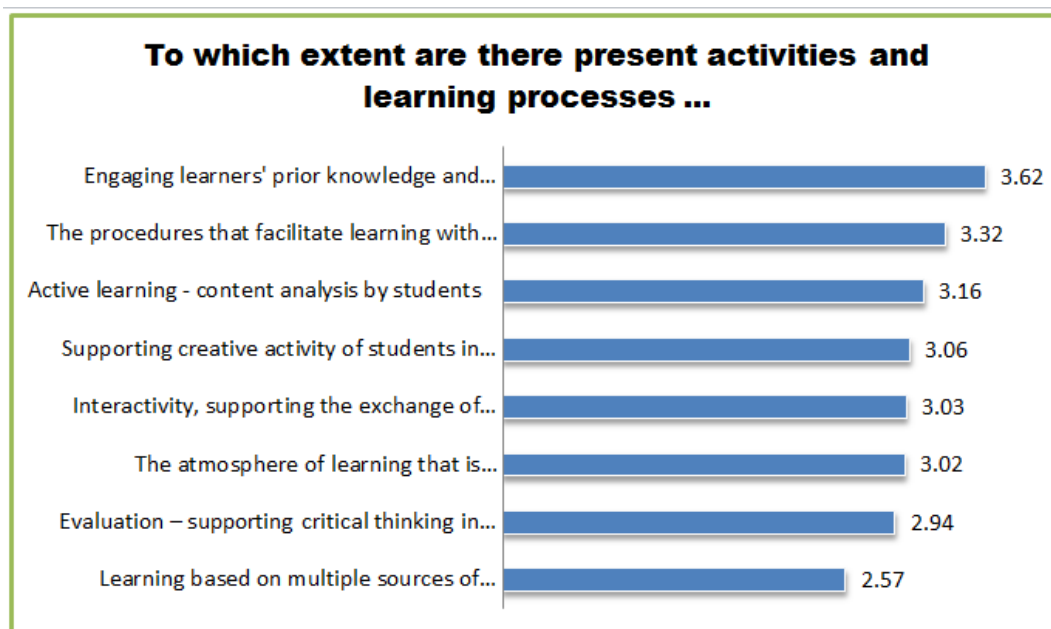
To which extent are present the activities and learning processes on which depends the development of critical thinking in students?

Based on the perception of Montenegrin students regarding what is happening in classrooms, we determined:

- the extent to which the school allows freedom of opinion, expression and critical attitude of its students.
- the extent to which learning in school is based on multiple sources of information?
- the extent to which it activates the student's prior knowledge and out-of-school experience.
- the extent to which the school encourages actions that facilitate the understanding of the learning content.
- the extent to which teaching supports the activities leading to the analysis of the content that is being taught.
- the extent to which teaching supports synthesis, and the creativity of students.
- the extent to which teaching supports the evaluation, and critical thinking in students.
- the extent to which learning takes place through discussion and exchange of views in the classroom.

In general, the procedures relevant to the development of critical thinking in students which are predominantly present are (see Table 6), those which engage students' knowledge and provide an understanding of the learning content. On the other hand, students rarely learn on the basis of different and multiple sources of information, the students are given little opportunity to express their own judgments, and learning takes place in an atmosphere for which it cannot be said that it is characterized by freedom of thought, expression and critical attitude of students.

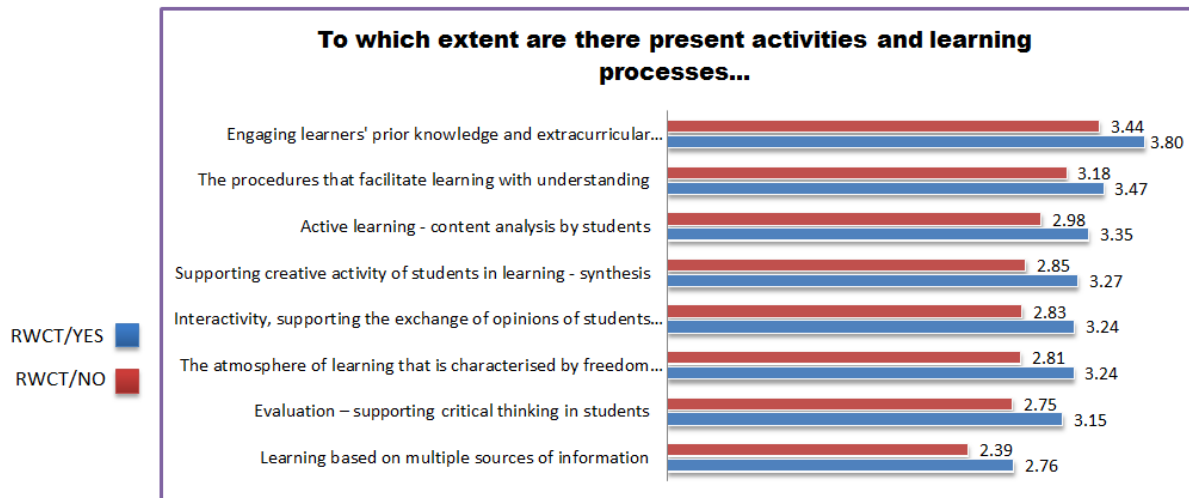
TABLE 6.
Representation of certain activities and processes of learning
(total sample)



It seems that the representation of processes on which depends the development of critical thinking in students is higher in teachers who have had training in the application of RWCT methods compared to other teachers (see Table 7).

Table 7

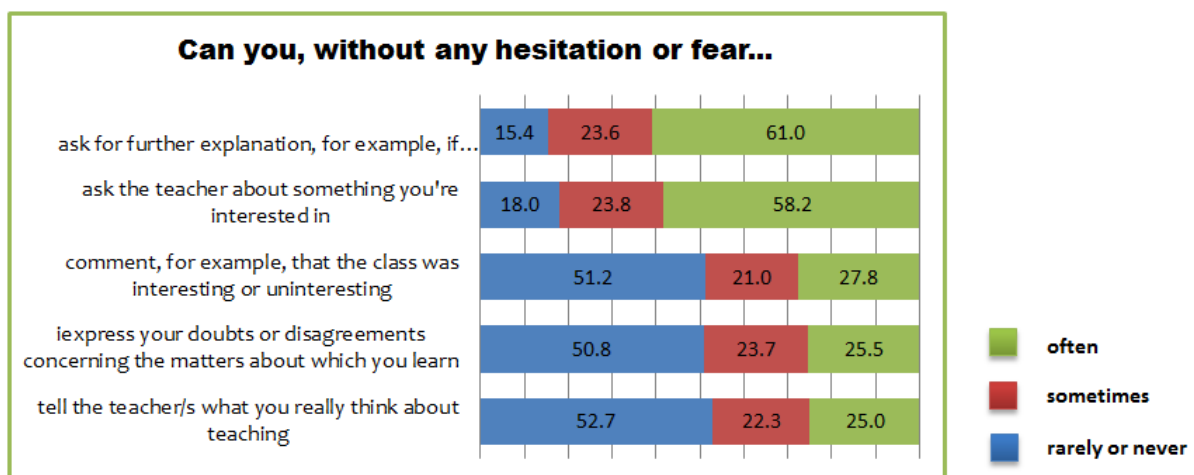
Representation of certain activities and processes of learning
(separately for the two sub-samples)



2.1. Open, free and critically-oriented learning atmosphere

Open, free and critically-oriented atmosphere is the first prerequisite for learning, expressing, and then the development of critical and creative thinking in students. The aim of the research was to determine the extent to which the school allowed freedom of thought, expression and critical attitude of students, i.e. the extent to which the student feels free, during the class, to say to the teacher what he or she thinks without any fear; to ask, comment, express doubt or disagreement with the content of learning or the way of teaching, to seek further clarification etc.

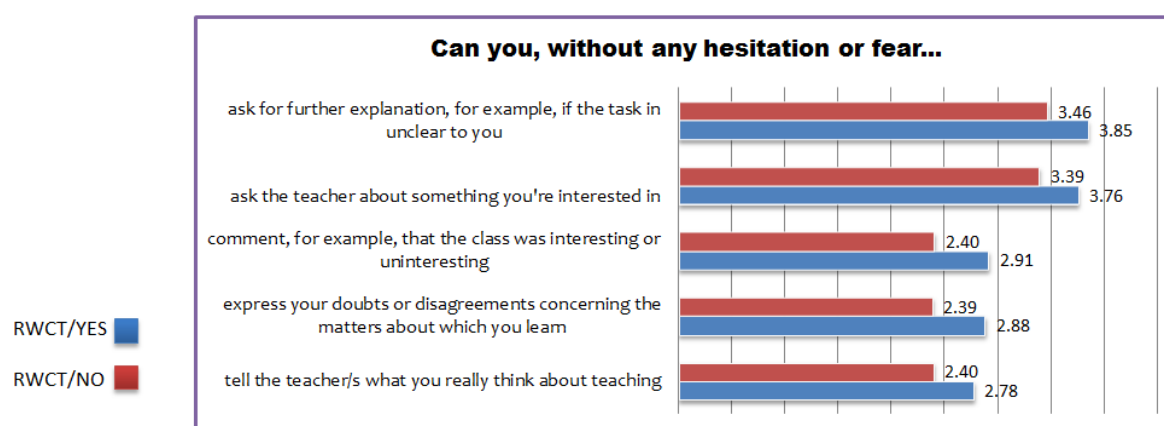
TABLE 8.
Representation of certain indicators of open, free and
critically-oriented atmosphere of learning (total sample)



In most cases, students have the freedom to seek further clarification when the task is not clear to them or to ask questions related to what they are interested in (see Table 8). They feel less free to

offer their comments on the class itself (for example, to say that the class was interesting or uninteresting), or to express disagreement in connection with what they learn, or to honestly say what they really think about teaching.

Table 9
Representation of certain indicators of open, free and critically-oriented atmosphere of learning
(separately for RWCT/YES and RWCT/NO)

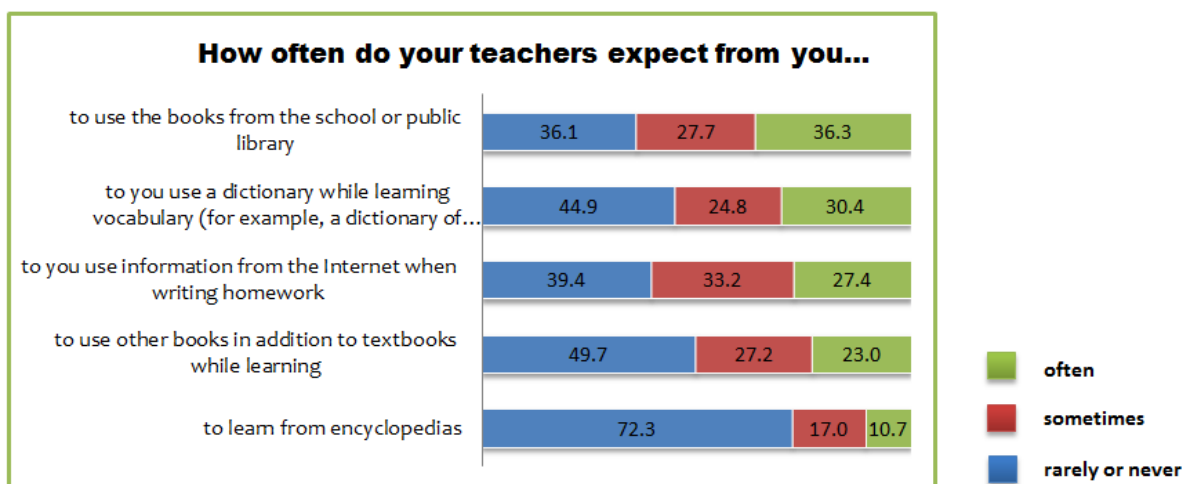


According to the results of this research open, free and critically minded atmosphere of learning is more present in teachers who attended the training program RWCT compared to other teachers (see Table 9)

3.2. Multiple sources of information

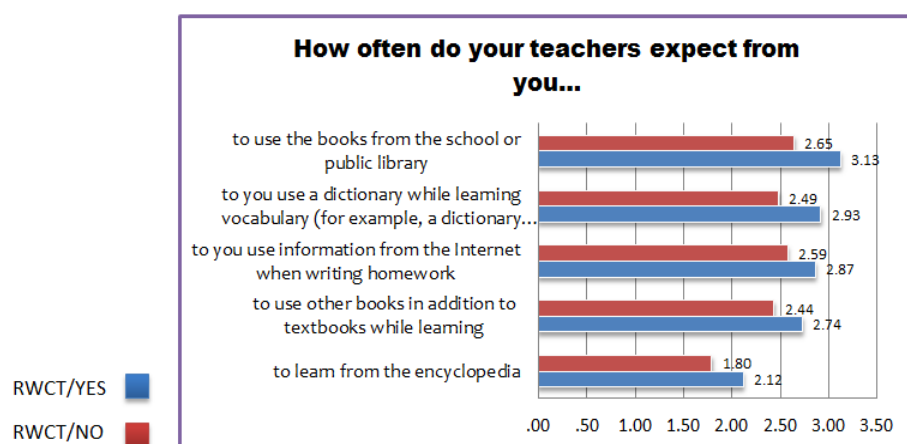
From the standpoint of development of critical thinking, using a number of different sources of information and activities which mean selection and comparing information, especially those who have different positions, is a necessary condition of learning. The aim of this study is to determine the extent to which learning in school is based on multiple sources information, i.e. the extent to which students are allowed or expected to use other sources of information, such as information from the Internet, encyclopedias and other books, books from local or school library, dictionaries while studying or doing homework.

TABLE 10
Representation of indicators of learning based on
multiple sources of information
(total sample)



It seems that practice where the student is encouraged to use of other sources of information, such as information from the Internet, encyclopedias and other books, books from local or school library, dictionaries and in addition to textbooks, is quite rare. Learning is mainly based on information from textbooks, or those that are obtained from the teacher (see Table 10).

Table 11
Representation of indicators of learning based on
multiple sources of information
(separately for RWCT/YES and RWCT/NO)



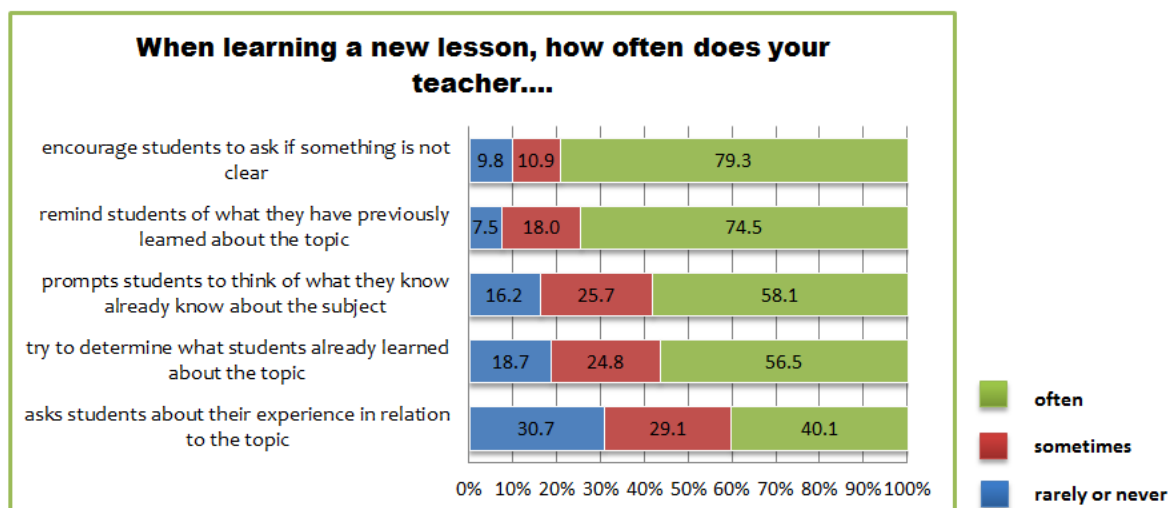
It seems that learning based on multiple sources of information is more frequent in teachers who attended the RWCT training program compared to other teachers (see Table 11).

3.3. Evocation, engagement of students' prior knowledge

In RWCT (Reading and Writing for Critical Thinking) evocation - determination, evoking and connecting prior and new knowledge in students, is the very first stage of the ERR (evocation – realization of meaning- reflection) of active learning and the development of critical thinking. Our aim is to determine the extent to which teaching engages students' previous knowledge and out of school

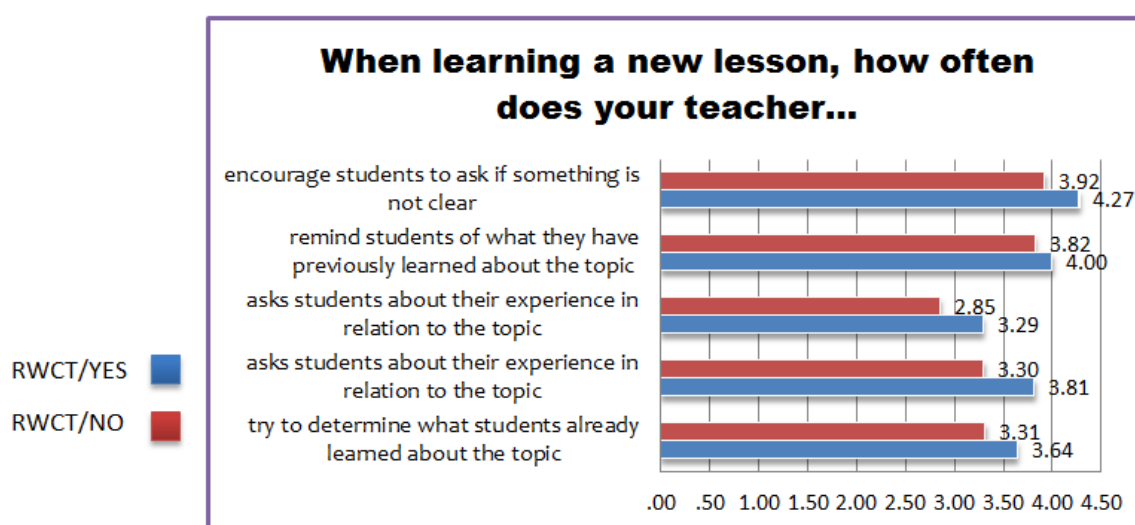
experience, or how often teachers, when covering a new topic, establish students' prior knowledge, ask students about their experiences in relation to the topic, and associate the topic with what is previously taught in the same or other objects, etc.

Table 12
Representation of indicators of engagement of
student's previous knowledge
(total sample)



It seems that in schools in Montenegro, practice of engaging students' previous knowledge and out of school experiences is largely present, i.e. teachers, when covering a new topic, establish students' prior knowledge, ask students about their experiences in relation to the topic, and associate it with what has previously been taught in the same or in other subject.(see Table 12)

Table 13
Representation of indicators of engagement of
students' previous knowledge
(separately for RWCT/YES and RWCT/NO)

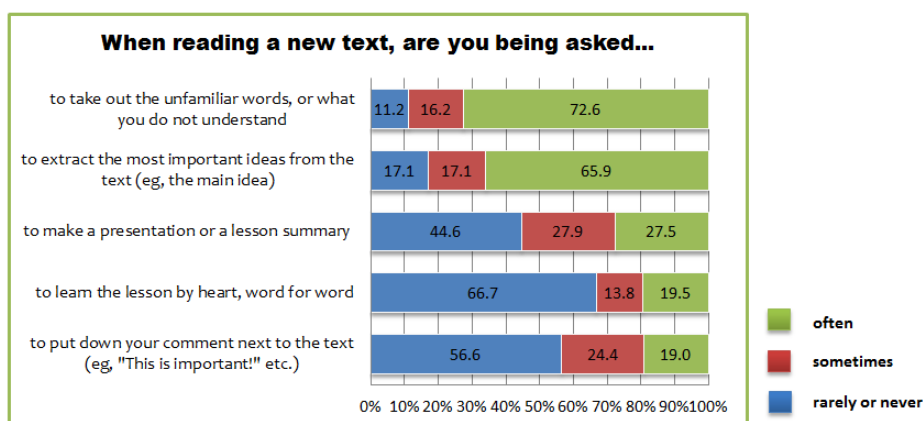


Engaging student's previous knowledge and out of school experiences is more frequently represented among the teachers who attended the RWCT program compared to other teachers (See Table 13).

3.4.Understanding

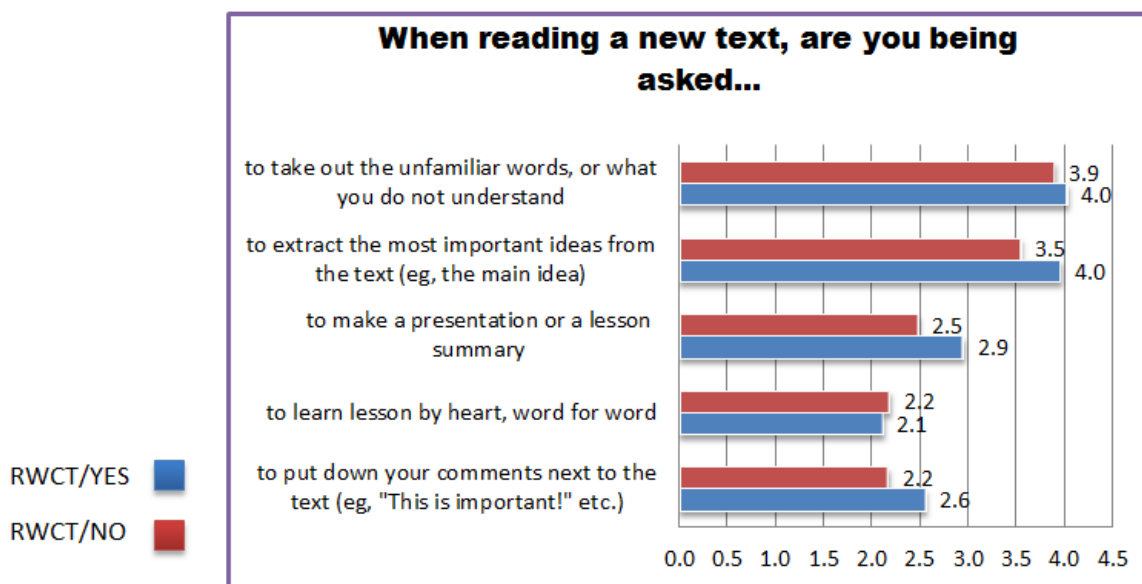
In RWCT (Reading and Writing for Critical Thinking) realization of meaning, i.e. understanding is the second phase of the ERR (evocation - realization of meaning - reflection) of active learning and the development of critical thinking which involves several important cognitive activities. Unlike passive acceptance, mere memorizing the learning content, understanding means students' active, meaningful organization and reorganization of content that is being learned. The aim of our research was to ascertain the extent to which the school expects from its students to learn with understanding, i.e. how often the school requires students to highlight what is important or what is unknown in a text; to put down their comments, to make the lesson summary and to draw own conclusions, etc.

Table 14
Representation of indicators of the procedures
for understanding of the learning content
(total sample)



It seems that the practice of learning the lessons by heart, word for word is rare in our schools. Teachers generally expect learning with understanding, and in that sense they encourage students to highlight what is most important or what is unknown to them. To a significantly lesser extent, students are encouraged to put down their own comments next to a text, to make presentations or lesson summaries and draw their own conclusions (see Table 14).

Table 15
Representation of indicators of the procedures
for understanding of the learning content
(separately for RWCT/YES and RWCT/NO)

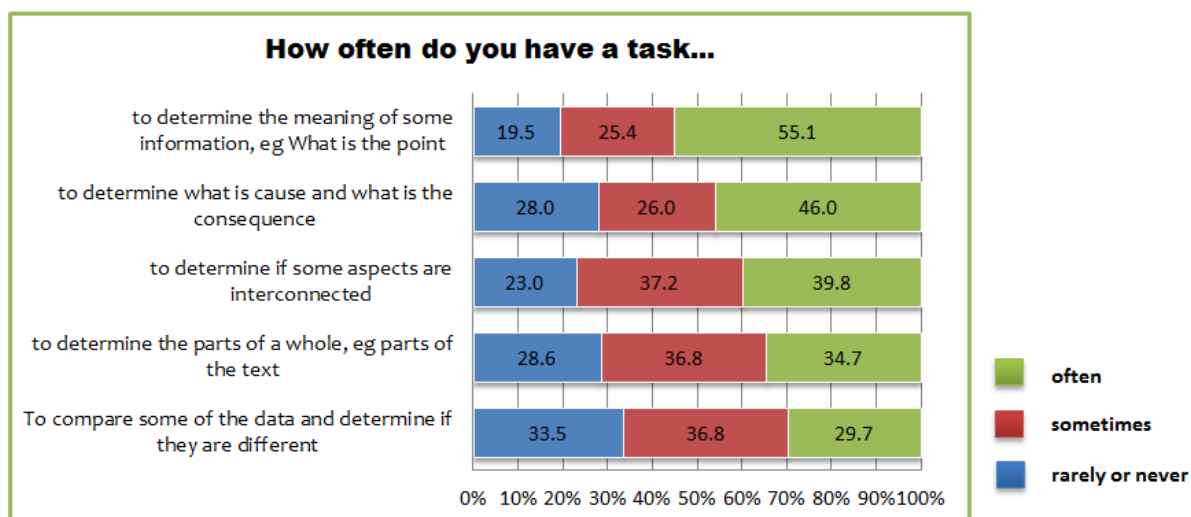


The procedures that facilitate the creation and understanding of the contents are more frequently represented among the teachers who attended the RWCT program compared to other teachers (see Table 15).

3.5. Analysis of content that is being taught

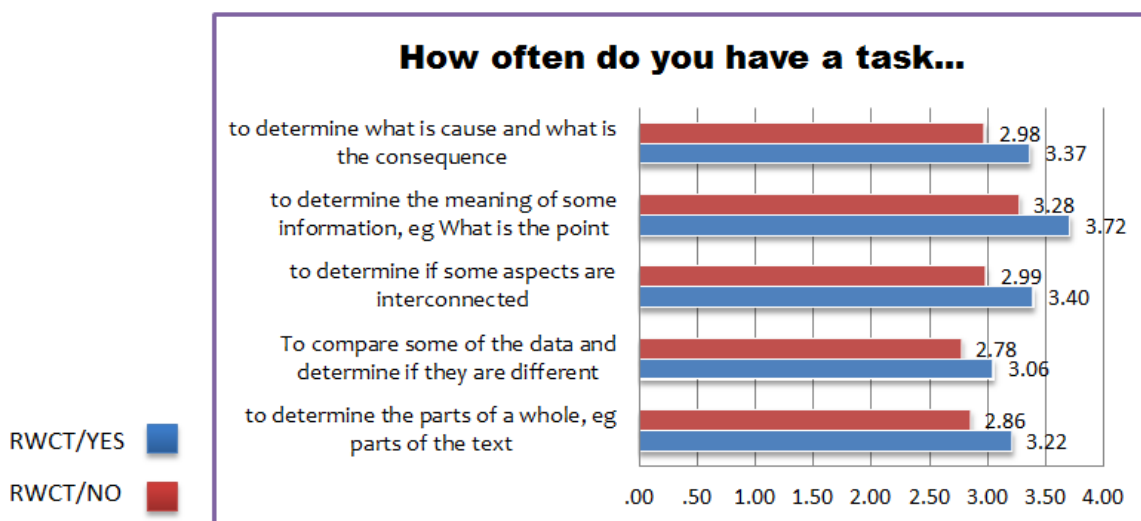
Learning is an active process where students are intellectually engaged, when analyzing, comparing and explaining the information that they learn. The aim of the research was to determine the extent to which teaching supports certain learning activities: ANALYSIS, i.e. how often the students are asked to decompose a whole e.g. text, to its constituent elements; COMPARISON - to list similarities and/or differences, common and distinctive features (of texts, information, objects, phenomena, etc.); CLARIFICATION, i.e. to determine the meaning of certain parts of a text e.g. to determine the causes and consequences.

Table 16
Representation of certain indicators that include
procedures of analyzing the content that is taught
(total sample)



There is a considerable number of teachers who encourage students to analyze the contents, to decompose texts to the constituent elements; to compare, to identify similarities and/or differences, to determine common and distinctive features (of texts, information, objects, phenomena, etc.); to explain, or to determine the meaning of certain parts of the text for example, to determine the causes and consequences. In addition to these teachers there is a fair number of those who never or very rarely work in this manner (see Table 16).

Table 17
Representation of certain indicators that include procedures
of analyzing the content that is taught
(separately for RWCT/YES and RWCT/NO)

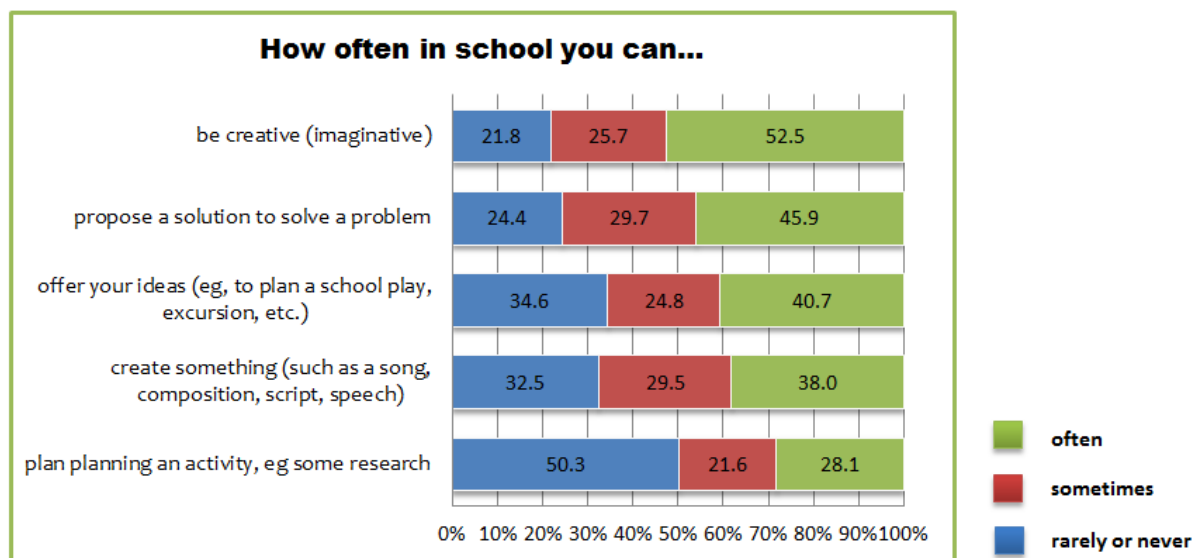


Teaching which the supports the analysis of the content is more frequently represented among the teachers who attended RWCT program compared to other teachers (see Table 17).

3.6.Synthesis, creative activity of students

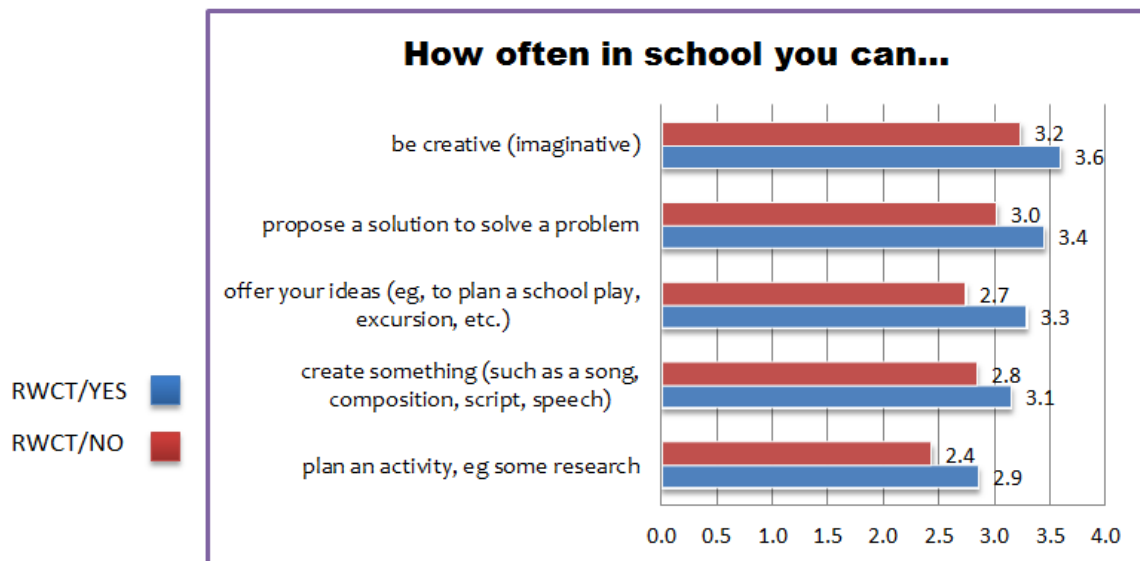
Synthesis means using assignments or school activities that give student a possibility create new products (text, presentation, explanation, model etc.) based on the known ideas, or what has been taught. The aim of this study was to determine the extent to which school supports creativity of students, i.e. how often the students are asked to individually make a statement, to plan an activity, or to propose or give ideas and to anticipate consequences of certain events, etc.

TABLE 18.
Representation of certain indicators of
creative activities of students
(total sample)



As in the previous case, There is a considerable number of teachers who encourage creative activities of students, asking them to independently make a statement, to give their ideas, to plan activities. In addition to these teachers there is a fair number of those who never or very rarely work in this manner (see table 18).

TABLE 19.
Representation of certain indicators of
creative activities of students
(separately for RWCT/YES and RWCT/NO)

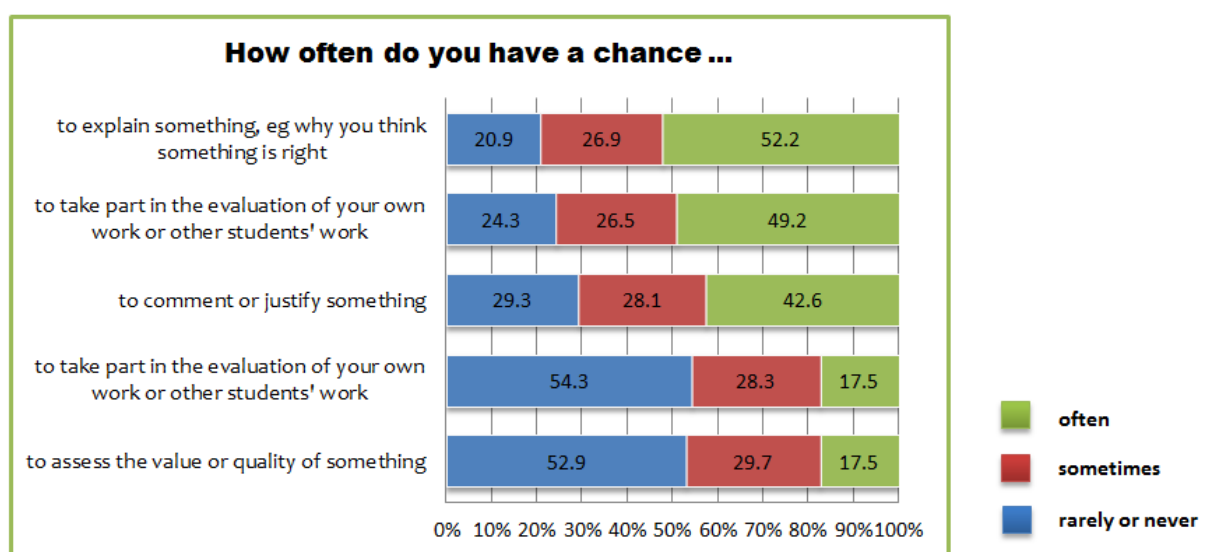


Teaching which supports creative activities of students is more often present in teachers who attended RWCT program compared to other teachers (see Table 19)

3.7.Evaluation, critical thinking

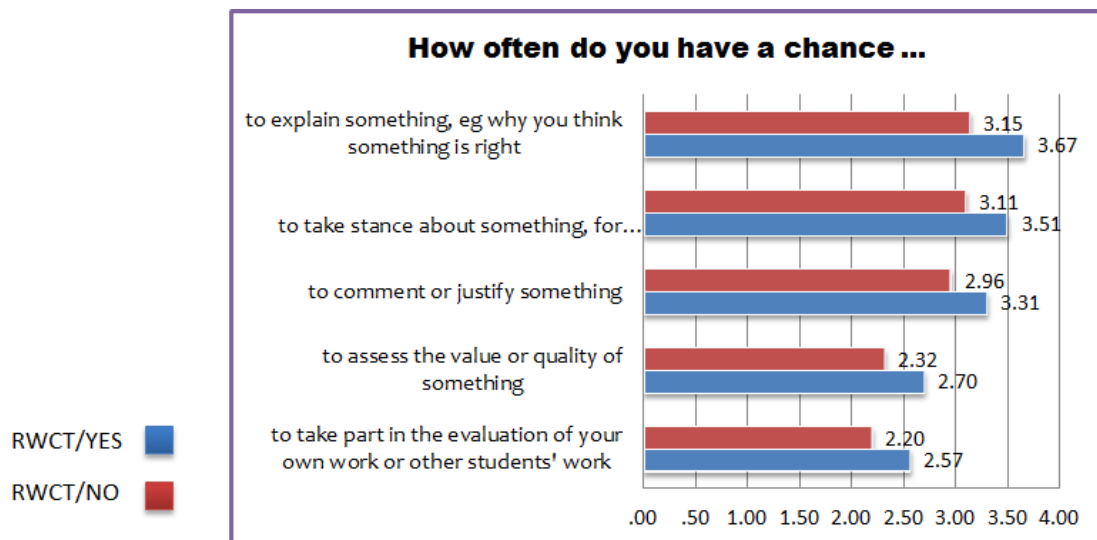
Evaluation in this sense entails assignments or school activities which require evaluation capability, i.e. valuation of any content, with a clear, explicit criteria and arguments. The aim of this research was to determine the extent to which teaching supports the evaluation, i.e. how often the school requires students to evaluate, i.e. to assess/evaluate the quality, accuracy, relevance, appropriateness of something; to argument their own opinions (attitudes, beliefs etc).

Table 20
Representation of certain indicators of evaluation
(total sample)



Activities concerning argumentation, i.e. encouraging students to opt or to specify arguments for their attitudes seem to be supported in teaching. It cannot be said for activities related to the evaluation. Students rarely have opportunity to evaluate the quality or value of something, to participate in evaluating their own work or the work of other students (see Table 20).

Table 21
Representation of certain indicators of evaluation
(total sample)

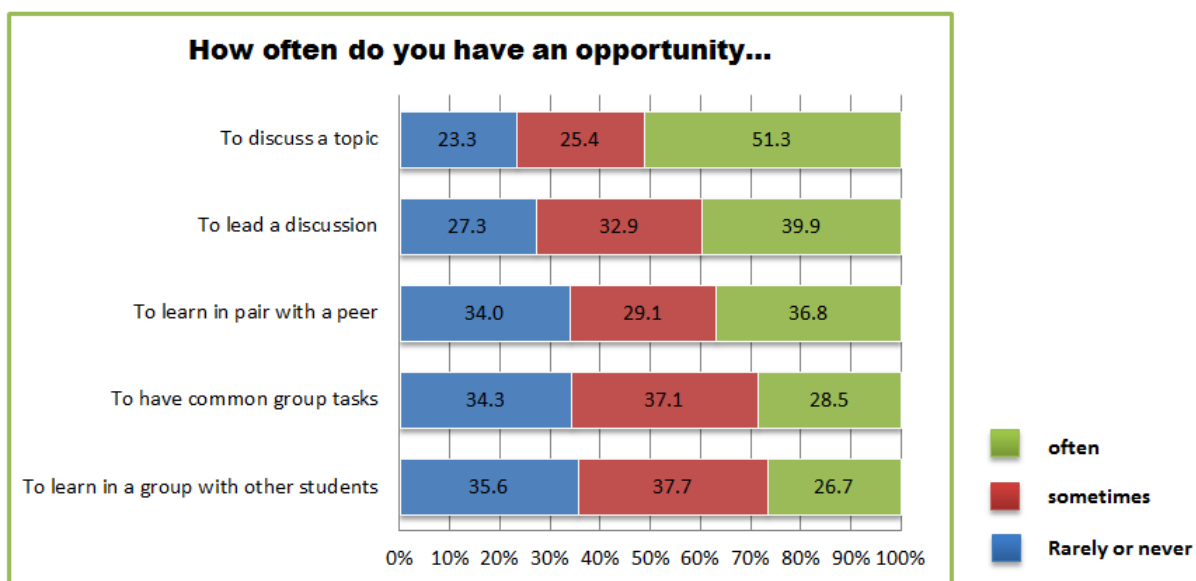


Teaching which supports evaluation and argumentation is often represented in the teachers who attended RWCT program compared to other teachers (see Table 21).

3.8.Interactivity of learning

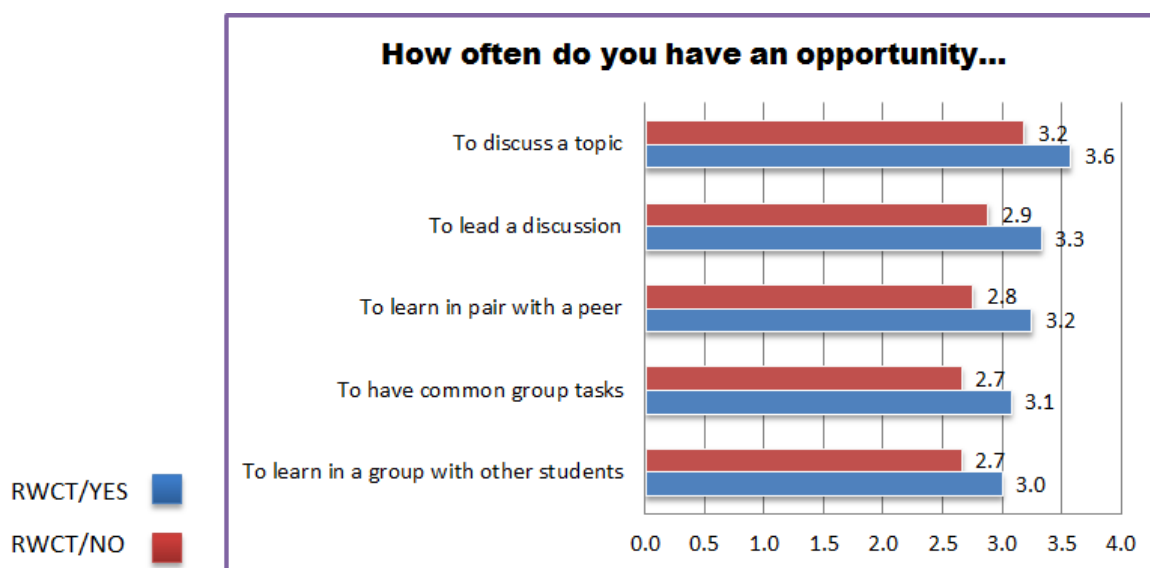
Active and interactive learning are important conditions for the development of critical thinking in students. Active learning is every kind of learning that engages students intellectually. Interactive learning includes all forms of teaching and learning that take place through interaction, exchange of views of teachers and students in the classroom. The aim of this research was to determine the extent to which learning takes place interactively, in pairs or small groups, i.e. how often students have the opportunity to discuss, debate, and/or to learn in a group.

Table 22
Representation of certain indicators of interactive learning
(total sample)



There is a significant number of teachers who organize learning through debates and discussions in pairs or small groups. But also there are teachers who rarely or never make that effort (see Table 22).

TABLE 23.
Representation of certain indicators of interactive learning
(separately for RWCT/YES and RWCT/NO)

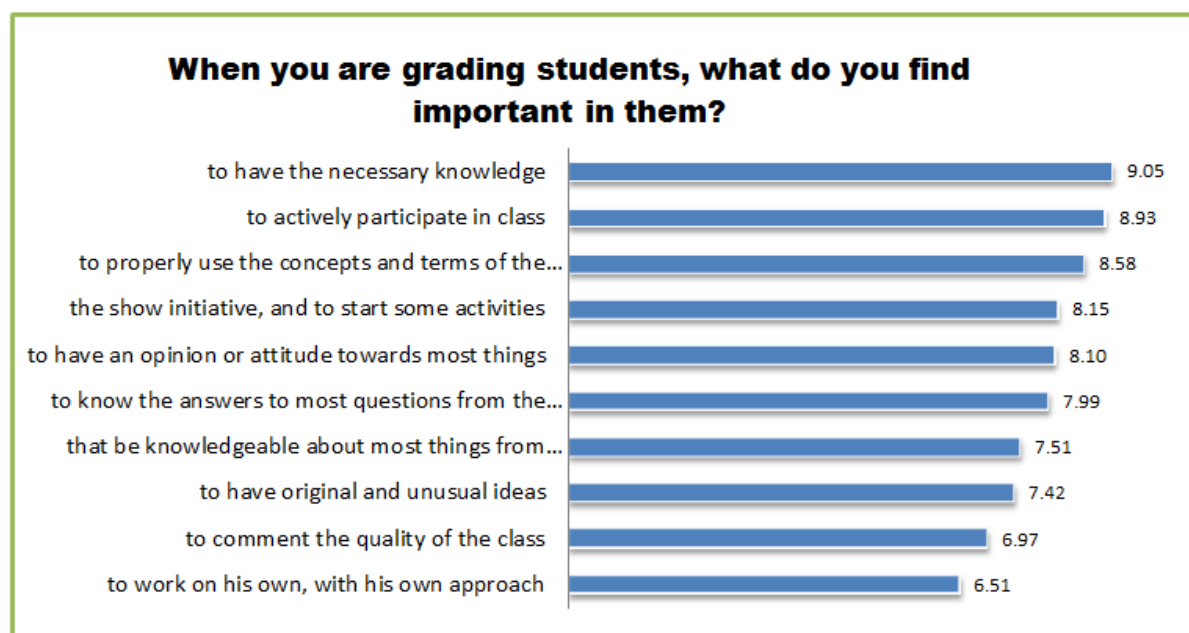


Teaching in which learning takes place through discussion and exchange of views in pairs and groups is more frequently represented among the teachers who attended RWCT training compared to other teachers (see Table 23).

4. To which extent is the assessment of students aligned with the needs of the development of critical thinking ?

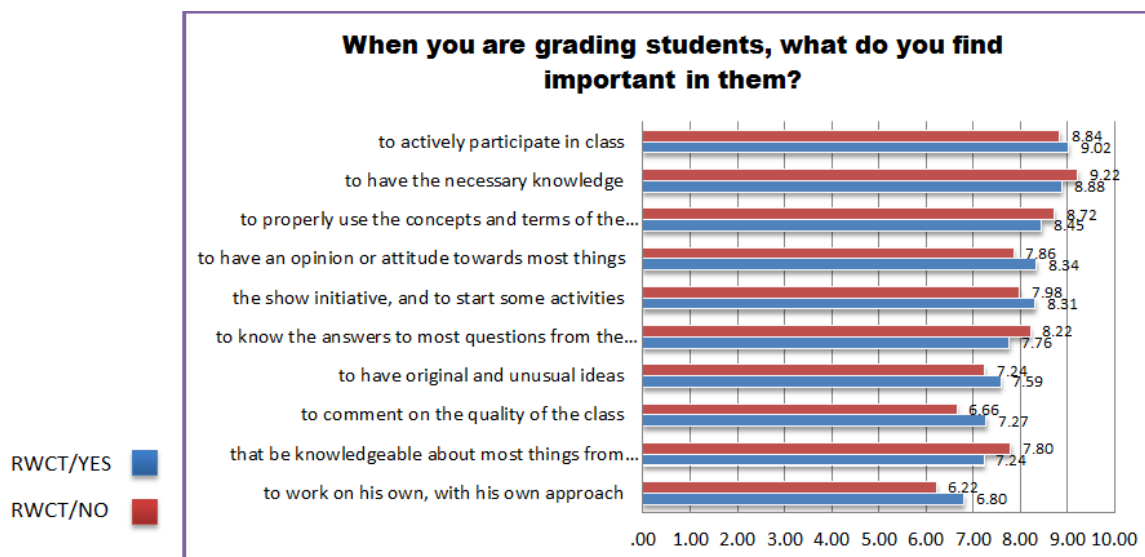
Assessing students' work significantly influences outcomes of learning. The aim of this research was to determine the extent to which the assessment supports the critical thinking of students, i.e. how important for the teacher is that the student is independent, initiatory, creative, independent in thought and active in the discussions.

TABLE 24.
Representation of certain qualities that a teacher
takes into account when assessing students
(total sample)



Despite the fact that the development of critical thinking of students is one of the primary goals of school, when teachers assess students in Montenegro they primarily value knowledge, working ethics in the class as well as the proper use of terms and concepts that are taught. It is only after these that teachers appear to value and assess initiative in students, their opinions, attitudes about something etc. It is interesting that the least appreciated characteristics of students are originality, independence of thought and action (see Table 24).

TABLE 25.
Representation of certain qualities that a teacher
takes into account when assessing students
(separately for RWCT/YES and RWCT/NO)



When comparing two sub-samples of teachers in relation to the values on which the students are assessed we observe significant differences. Teachers who attended RWCT training to a greater extent value the opinion of students, their initiative, originality and independence of thought and action (see Table 25.)

Conclusions:

The aim of the research

- To determine the extent to which teaching/learning in primary schools in Montenegro supports the development of critical thinking
- Given the support for the development of critical thinking in students, we want to determine whether the RWCT teachers' teaching differs from the teaching of those who were not trained to apply RWCT methods (subject teachers).

Based on the results we found:

To which extent are teachers in Montenegro trained for the development of critical thinking in students?

- Teachers in Montenegro are primarily trained for the traditional roles of teaching - planning and preparing for classes and lecturing on the program content. In relation to this, teachers are less competent in applying the methods of active and interactive learning, and **especially for the development of critical thinking in students.**
- Teachers who attended the RWCT training consider themselves more competent in relation to other teachers in applying methods of active and interactive learning, and **especially for the development of critical thinking in students.**

Which goals do they have in mind when planning and realizing teaching?

- Among the three main objectives of the school, teachers in Montenegro list the goal of developing critical thinking in students. This goal takes **the second place** in importance **behind the goal to develop the ability to learn**.
- When comparing the two sub-samples of teachers in relation to the assessment of the importance of individual school goals we observed significant differences. Teachers who did not have RWCT training **not only neglect the importance of the development of critical thinking in students, but they were to a greater extent oriented to the transfer of knowledge and information, and knowledge of the concepts and terms**.

To which extent are present activities and learning processes leading to the development of critical thinking in students?

- On the whole, the processes that are important for the development of critical thinking of students are dominated by those which **engage students' previous knowledge and provide an understanding of the learning content**. On the other hand, it appears that learning is rarely based on different and multiple sources of information, the students are not given too many opportunities to express their own judgments, and learning takes place in an atmosphere for which cannot be said that it is characterized by freedom of thought, expression and critical attitude of students.
- It appears that the representation of processes leading to the development of critical thinking is **higher in teachers who have had training in the application of RWCT method** compared to other teachers.

To which extent is the grading adjusted to the critical thinking development in students?

- Despite the fact that the development of critical thinking of students is one of the primary goals of school, when teachers assess students in Montenegro, they primarily value their knowledge, commitment in the classroom as well as the proper use of terms and concepts that are taught. It is only after these, that they value initiative of students, their opinions, attitudes etc. It is interesting that the least favored characteristics of students listed were - originality, independence of thought and action.
- When comparing two sub-samples of teachers in relation to the values on which the students are assessed, we observe significant differences. **Teachers who attended RWCT training to a greater extent appreciate the opinion of students, their initiative, originality and independence in thought and action**.

Particularly significant part of this study is the part that relates to the analysis of the representation of certain activities and processes of learning on which depends the development of critical thinking in students.

We examined: the extent to which school allowed freedom of thought, expression and critical attitude of students; the extent to which learning in school was based on multiple sources of information; the extent to which it fostered the use student's prior knowledge and curricular experience; the extent to which the school encouraged actions that facilitated the understanding of the learning content; the extent to which teaching activities were supported by the analysis of the content that was taught; the extent to which the teaching supported synthesis, - the creativity of students; the extent to which the teaching supported the evaluation, - critical thinking of students; the extent to which learning took place through discussion and exchange of views in the classroom?

Open, free and critically oriented atmosphere

- In most classrooms students have the freedom **to seek further clarification when the task is not clear or to ask the teacher questions in relation to what interests them**. Far less encourage are they to give comments on the class (for example, to say that the class was interesting or uninteresting), to express doubts or disagreement in connection with what they learn, or to honestly say what they really think about teaching.
- According to the results of this research - open, free and critically minded atmosphere of learning is **to a significantly greater extent present in the work of teachers who attended the RWCT training program** compared to those who had not.

Multiple sources of information

- It seems that the practice in which the student is encouraged or expected to use other sources of information, such as information from the Internet, encyclopedias and other books, books from local or school library, dictionaries etc. in addition to textbooks, the simultaneous while studying in school or during the handling of domestic tasks, at home - is not sufficiently present. **Learning rests largely on information from textbooks, or those which can be obtained from the teacher**.
- It appears that **learning based on multiple sources of information is more frequent in the teachers who attended the RWCT training program** compared to those who had not.

Evocation, engaging student's previous knowledge

- It seems that in schools **largely maintain the practice of engaging students' prior knowledge and extracurricular experiences**, which means that teachers, when processing a new topic, establish students' prior knowledge, ask them for their experience in relation to the theme, and associate the theme with what has previously been taught in the same or other subjects.
- Engaging the student's previous knowledge and extracurricular experiences is **more frequently represented among the teachers who attended the RWCT training program** compared to those who had not.

Understanding

- It seems that the practice of learning the lessons by heart, word for word, is rare in our schools. Teachers generally expect students to learn with understanding, and in that sense they encourage them to learn through isolating what is most important or what is unknown to them. In a significantly lesser extent, students are encouraged to make their own comments, to make presentations or draw their own conclusions.
- The presence of activities leading to learning with understanding is **more frequently represented among the teachers who attended the RWCT training program** compared to those who had not.

Learning content analysis

- There is a considerable number of teachers who, during the learning, encourage students to **analyze** the content, to decompose it (texts for example) to the constituent elements; **to compare**, to identify similarities and/or differences, common and distinctive features (texts, information, objects, phenomena, etc.); **to explain**, or to determine the meaning of certain parts of the text for example, to determine the causes and consequences. In addition to these groups there is fair number of those who never or very rarely do this.
- Classes which support creative activities of students are more frequent in teachers who attended the RWCT training program compared to those who had not.

Creative activities of students - synthesis

- As in the previous case, there is a considerable number of **teachers who encourage creative activity of students**, asking them to independently make a statement, offer their own ideas, to plan an activity. In addition to these there is a fair number of those who never or rarely do.
- Classes which support creative activities of students are **more frequent in teachers who attended the RWCT training program** compared to those who had not.

Evaluation – critical thinking

- Activities concerning **argumentation**, i.e. encouraging students to opt or to specify arguments for their attitudes seem to be supported in the classroom teaching. It cannot be said for activities related to the **evaluation**. Students rarely have the opportunity to evaluate the quality or value of something, to participate in evaluating their own work or the work of other students.
- Teaching which supports evaluation and argumentation is **more often represented in the work of teachers who attended the RWCT training program** compared to those who had not.

Interactivity of learning

- There is a **significant number of teachers who organize learning through debate and discussion** in pairs or small groups. But also there are teachers who rarely or never do that..

- Classes in which learning takes place through discussion and exchange of views in pairs and groups are **more frequently represented among the teachers who attended the RWCT training program.**

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